



Intelligent Spacecraft Interface Systems (ISIS) Lab

A key aspect of the next-generation spacecraft will be the interaction of the crew with the on-board systems. The Intelligent Spacecraft Interface Systems (ISIS) Lab contains a cockpit simulator with reconfigurable screens that show information to the crew about the vehicle, allowing it to act as a ground test bed which can be used to establish the readiness of new system architecture concepts.

Overview

The ISIS Lab contains a reconfigurable cockpit simulator for current and future spacecraft. Presently, the simulator represents many of the displays and switches in the Space Shuttle. We are measuring crew-member's workload, situation awareness, and performance during normal and off-nominal conditions. In the future, we will implement proposed modifications to the shuttle displays and determine whether and how much the crew's performance is affected. Participants in ISIS studies include astronauts and former commercial airline pilots.

Objectives

- Implement methods for analyzing cockpits.
- Obtain objective metrics such as eye movement recordings.
- Obtain subjective metrics such as workload and situation awareness.
- Develop a crew-systems concept for the next-generation spacecraft.
- Improve fault diagnosis and management.
- Examine effects of different automation levels on crew performance.

Equipment

- Head-mounted eye tracker (by ISCAN)
- Flat panel monitors for showing displays
- Touch screens to allow interaction with a simulated keyboard and switches



Relevance to Exploration Systems

The lab is uniquely equipped to collect a variety of performance measures such as the crew's response time and accuracy when resolving malfunctions.

H&RT Program Elements:

This research capability supports the following H&RT program elements:

ASTP: Software, Intelligent Systems & Modeling

TMP: Advanced Space Platforms & Systems

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